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10/569,552	02/27/2006	Yoshimasa Hashimoto	OGW0423	7758

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EXAMINER	
MAKI, STEVEN D	

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1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/569,552	HASHIMOTO ET AL.	
	Examiner	Art Unit	
	Steven D. Maki	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-5,10 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-5, 10 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2) **Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002).**

Beckmann et al discloses a vehicle tire having a tread comprising land portions. The land portions may be blocks or ribs. Incisions are disposed in each land portion. The incision is formed using an embossed lamella metal sheet having a thickness of 0.4 mm to 0.8 mm (col. 5 lines 11-13). Therefore, the incisions have a width of 0.4 mm to 0.8 mm. Such incisions are also described by one of ordinary skill in the art as "sipes". In the embodiment of **Figures 1a and 1b**, the lamella sheet has bending lines 3. Each bending line defines a waveform. <u>The embossing depth p (amplitude p) in the direction normal to the longitudinal direction of the incision is 0.5 mm to 3.0 mm</u> (col. 5 lines 9-11). The direction normal to the longitudinal direction of the incision is the tire circumferential direction when the longitudinal direction of the incision is at an angle of zero degrees with respect to the axial direction. The bending angle gamma is 150-90 degrees such as 120 degrees (Figure 1b, col. 5 lines 1-6). <u>An angle gamma of 120 degrees corresponds to a "tilt angle" of 30 degrees</u>. Beckmann et al illustrates a distance B and discloses "B" as being the minimum mutual spacing resulting from the above noted displacement of the waveforms (Figure 1a, col. 4 lines 62-64). Beckmann

et al teaches that B is 0.5 to 3 mm (col. 4 lines 63-64). In other words, distance "B" is the shortest *spacing* between one point on one waveform and another point on another adjacent waveform wherein B = 0.5 to 3 mm. Beckman et al illustrates a distance C and discloses "C" as being the amount of displacement of the waveforms relative to each other (Figure 1a, col. 4 lines 61-62). In other words, distance "C" is the *spacing* in the radial direction between one point on one waveform and another point on another adjacent waveform. Therefore, distance C and distance B describe the *spacing* between one point on one waveform and another point on another waveform wherein the minimum value of the *spacing* is 0.5 to 3 mm. Beckmann et al illustrates an amplitude A as being the distance between a trough and a peak of a waveform (Figure 1a). Beckmann et al teaches that the amplitude A is C/2 to 3C (col. 4 lines 65-67). Therefore, the *minimum* amplitude A in the radial direction in the embodiment of Figure 1a, 1b is 0.25 mm to 1.5 mm when the *spacing* between the waveforms is *constant* (B = C = 0.5 mm; 0.5 mm / 2 = 0.25 mm; 0.5 mm x 3 = 1.5 mm). The range of "0.25 to 1.5 mm" overlaps the range of 0.5 to 3.5 mm (claim 5). Before addressing other figures, Beckmann et al states:

> In the event that hereinafter in the description of the following exemplary embodiments, nothing is different is mentioned, then, the aforementioned dimensions regarding the spacing between adjacent bending lines, the embossing depth and the thickness of the lamella sheet are also valid for these variants.

In the embodiment of **Figures 3a and 3b**, the lamella sheet is defined by bending lines 3" and bending lines 4". The resulting lamella sheet (figure 3b) defines a zigzag shape with an embossing depth p (amplitude p) in the directional normal to the longitudinal

direction of the incision and a zigzag shape with an amplitude C" in the radial direction. The sipe made by the lamella sheet embodiment of Figure 3a and 3b is a "3-D sipe". Beckmann et al describes each of Figures 1a and 3a as being a "top plan view". Beckmann et al describes each of Figures 1b and 3b as being an "axonometric view". In view of Beckmann et al's description of each of Figures 1b and 3b as being an "axonometric view", one of ordinary skill in the art would readily understand the Y-axis (radial direction) and X-axis (longitudinal direction) in Figures 1b and 3b as having the same proportional ratio whereas the Z-axis (direction of embossing depth p) is at a different scale. Beckmann et al teaches the tire has improved travel characteristics such as improved handling as well as wear characteristics like break outs and irregular wear (abstract, col. 2 lines 59-64). Beckmann et al also teaches that the walls of the incisions can only slide off each other with difficulty which as the consequence that energy is converted into heat through friction and slid is reduced (col. 8 lines 5-9).

The claimed tire corresponds to Beckmann et al's tire having sipes in blocks made using the lamella sheet embodiment of Figures 3a and 3b. It is noted for example that Figure 3a of Beckmann et al corresponds to Figure 8a of applicant's disclosure. The claimed bent portions correspond to the portions of the sipe defined by the zigzag bending lines 3" (Figure 3b). As can be seen from figure 3b, <u>bending lines 3" exist at least two positions in the radial direction</u>. One of ordinary skill in the art would have readily understood that the vehicle tire is a pneumatic tire. In any event, it would have been obvious to one of ordinary skill in the art to form Beckmann et al's sipes shaped by the lamella embodiment of Figures 3a and 3b in each of blocks of a tread of a

pneumatic tire such that the sipes *extend in the tire widthwise direction for example at angle of 0 degrees with respect to the axial direction of the tire* since (1) Beckmann et al teaches forming 3-D incisions (3-D sipes) in blocks of a tread of a *vehicle tire* using lamella sheets such as that shown in Figure 3b to improve handling, reduce skid and suppress wear, (2) Beckmann et al teaches providing the sipes such that they *extend generally in the transverse direction* (col. 7 lines 63-66) and (3) it is taken as well known / conventional per se in the tire art to form sipes in each of blocks defined by circumferential and transverse grooves of a tread of a pneumatic tire such that the sipes extend in the widthwise direction (transverse direction) for example at an angle of 0 degrees with respect to the axial direction of the tire so that the pneumatic tire has improved anti-skid / braking properties.

As to claims 3-5, it would have been obvious to one of ordinary skill in the art to provide Beckmann et al's figure 3b embodiment such that the amplitude in the tire circumferential direction is constant, the tilt angle is smaller closer to the bottom of the sipe and the amplitude in the radial direction is larger closer to the bottom of the sipe since (1) Lagnier 965, also directed to sipes for a tire tread, suggests <u>retaining a constant circumferential distance or amplitude "a"</u>, *decreasing angle theta* as a function of depth and *increasing the pseudo-wavelength lambda* as a function of depth of a sipe zigzag trace extending in the radial direction (Figure 3C) to regulate rigidity and obtain greater uniformity of wear and (2) Lagnier 002, also directed to sipes for tire treads, teaches <u>using a constant amplitude lambda A for a zigzag trace of a 3-D incision (3-D sipe) extending in the transverse direction of a tire</u> and *varying the wavelength lambda*

B of a sipe zigzag trace extending in the radial direction (depth direction). See column 4 of Lagnier 002. It is noted that the zigzag trace shown in Figure 3C of Lagnier directly corresponds to the zigzag trace defined by bending line 4" of Beckmann et al. It is noted that the amplitude in the radial direction of bending line 3" increases as the wavelength of bending line 4" increases.

As to claim 5, Beckmann et al (when considered as a whole) suggests forming incisions (sipes) using the embodiment of Figures 3a, 3b such that an amplitude in the radial direction is within the claimed range of 0.5 to 3.5 mm. Beckmann et al's of sheet thickness = 0.4 to 0.8 mm, spacing B = 0.5 to 3.0 mm and amplitude A = C/2 to 3C as described with respect to Figures 1a, 1b apply to the embodiment of figures 3a, 3b. See col. 5 lines 14-20. With respect Figure 3a of Beckmann et al, applicant states and examiner agrees that "... the value of C is given by the equation (C = B / sin (α")). See page 8 of response filed 6-3-08. The trapezoidal shape defining angle α" in Figure 3a limits angle α" to being an acute angle between the range of 0 and 90 degrees. If angle α" is varied between 10 and 80 degrees when using distance B of 0.5 mm and applicant's equation of C = B / sin (α"), the distance C varies from 0.51 mm to 2.94 mm as shown below:

angle α"	B (min spacing)	sin (angle α")	C = B / (sin (angle α"))
10	0.5 mm	0.17	2.94 mm
20	0.5 mm	0.34	1.47 mm
30	0.5 mm	0.50	1.00 mm
40	0.5 mm	0.64	0.78 mm

50	0.5 mm	0.77	0.65 mm
60	0.5 mm	0.86	0.58 mm
70	0.5 mm	0.94	0.53 mm
80	0.5 mm	0.98	0.51 mm

As noted above, Beckmann et al teaches that the amplitude A is not smaller than C/2 and is not greater than 3C. When amplitude A = C / 2 (the lower end point), the range of 0.51 mm to 2.94 mm for C results in a range of 0.26 mm to 1.5 mm for amplitude A. The range of 0.26-1.5 mm overlaps the claimed range of 0.5 to 3.0 mm. When amplitude A = 3C (the upper end point), the range of 0.51 mm to 2.94 mm results in a range of 1.5 mm to 8.8 mm for amplitude A, which again overlaps the claimed range of 0.5 to 3.0 mm. In figure 3a, the illustrated angle α" is 35 degrees. At the illustrated angle α" of 35 degrees and Beckmann et al's disclosed end point of 0.5 mm for B, the value of C is 0.88 mm (B = 0.5 mm, α" = 35 degrees C = B / sin (α") = 0.5 / sin (35 degrees) = 0.5 mm / 0.57 = 0.88 mm). At the illustrated angle α" of 35 degrees and Beckmann et al's disclosed end point of 3 mm for B, the value of C is 5.3 mm (B = 3 mm, α" = 35 degrees C = B / sin (α") = 3 mm / sin (35 degrees) = 3 mm / 0.57 = 5.3 mm). Thus, the distance C for the incisions (sipes) made using the embodiment of figures 3a, 3b at the illustrated angle of 35 degrees is 0.88 to 5.3 mm. When A = C / 2 (the lower end point), the range of 0.88 mm to 5.3 mm for C results in a range of 0.44 mm to 2.7 mm for amplitude A. The range of 0.44 mm to 2.7 mm overlaps the claimed range of 0.5 to 5.0 mm. When amplitude A = 3C (the upper end point), the range of 0.88 mm to 5.3 mm results in a range of 2.6 mm to 16 mm for amplitude A, which again

overlaps the claimed range of 0.5 to 3.5 mm. In light of the above analysis, Beckmann et al is considered to disclose with sufficient specificity, an amplitude in the radial direction within the claimed range of 0.5 to 3.5 mm. In any event: it would have been obvious to one of ordinary skill in the art to form sipes (incisions) according to Beckmann et al's embodiment of Figures 3a, 3b such that the *amplitude in the radial direction is within the claimed range of 0.5 to 3.5 mm* in view of (1) Beckmann et al's teaching that the amplitude A" is not smaller than C"/2 and is not greater than 3C", (2) Beckman et al's teaching that the minimum spacing B" between the waveforms is 0.5 to 3.0 mm, (3) the illustrated relationship between distance B" and distance C" (e.g. C = B / sin (α")), which provides one of ordinary skill in the art general guidance as to the relationship between the dimensions (e.g. B", C", A") of the 3-D metal sheet used to form the 3-D sipes (3-D incisions) and (4) Beckmann et al's teaching that a tire having incisions (sipes) made using the disclosed 3-D metal sheets has improved handling, reduced skid and reduced irregular wear. With respect to the drawings conveying information, it is again that Beckmann et al describes each of Figures 1a and 3a as being a "top plan view" and each of Figures 1b and 3b as being an "axonometric view" (two of the three dimensions have the same proportional ratio).

The claimed tilt angles (claim 4) and amplitudes in radial direction (claim 5) would have been obvious in view of (1) the "tilt angle" and "amplitude in radial direction" suggested by Beckmann et al and (2) Lagnier 965's teaching to decrease angle theta and increase pseudo-wavelength lambda to regulate rigidity and obtain greater uniformity of wear. With respect to suitable tilt angles, Beckmann et al teaches angle

gamma of 90-150 degrees such as 120 degrees. An angle gamma of 120 degrees corresponds to a tilt angle of 30 degrees.

3) **Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002) as applied above and further in view of Japan 511 (JP 09-323511).**

As to claims 10 and 11, it would have been obvious to one of ordinary to provide Beckmann et al's blocks with the claimed shallow grooves since Japan 511 suggests using auxiliary sipes 11 having a depth less than 1.5 mm and zigzag sipes in blocks of a tire tread to improve performance on ice. The description of "vertical portion extending on a normal line direction" fails to define structure not suggested by the applied prior art. In particular, "vertical portion extending on a normal line to the tread surface is provided to the sipe in a section where the sipe joins to the tread surface" fails to require walls of the sipe to be oriented at 90 degrees to the tread surface.

4) **Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002) as applied above and further in view of Japan 511 (JP 09-323511) and Japan 916 (JP 2002-192916).**

As to claims 10 and 11, it would have been obvious to one of ordinary to provide Beckmann et al's blocks with the claimed shallow grooves since Japan 511 suggests using auxiliary sipes 11 having a depth less than 1.5 mm and zigzag sipes in blocks of a tire tread to improve performance on ice. Furthermore, it would have been obvious to

one of ordinary skill in the art to provide the sipes made using Beckmann et al's figure 3a, 3b embodiment with the claimed "vertical portion extending on a normal line direction" in view of Japan 916's disclosure of a "vertical portion" connecting the tread surface with sipe zigzag trace extending in the radial direction (figure 2, 4b)

Remarks

5) Applicant's arguments filed 1-28-09 have been fully considered but they are not persuasive.

Applicant argues that (1) Beckmann et al fails to disclose a zigzag shape formed in each of the bent portions of a sipe as recited in claim 3, (2) Beckmann et al fails to disclose that a tilt angle of the cutouts with respect to a normal line in the tire circumferential direction is smaller near the bottom of the cut-out than near the tread surface and (3) Beckmann et al does not teach that an amplitude of the cut-out in the tire radial direction is set larger at a bottom portion of the cut-out than near the tread surface. These arguments are not persuasive. Figure 3b of Beckmann et al, Figure 3C of Lagnier 965 and Figure 3 of Lagnier 002 are reproduced below:

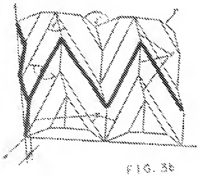

FIG. 3b

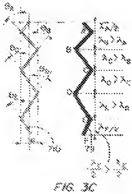

FIG. 3C

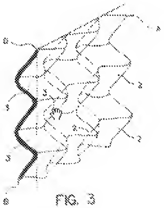

FIG. 3

The dark markings were added by the examiner to facilitate discussion of the applied prior art. **First:** Contrary to applicant's arguments, Beckman et al teaches bent portions having a zigzag shape with an amplitude in the radial direction. Figure 3b of Beckman et al shows a metal sheet for forming an incision (sipe). The sipe therefore has a shape corresponding to that shown in Figure 3b of Beckmann et al. The dark "horizontally extending" (widthwise) zigzag line 3" is a "bent portion having a zigzag shape in the tire radial direction". Claim 3 recites bent portions formed "at at least two positions in the tire radial direction". In other words, claim 3 only requires two bent portions having a zigzag shape with an amplitude in the radial direction. One of the claimed bent portions reads on the bent portion indicated by the dark horizontally extending zigzag line 3" in marked up Figure 3b. The other claimed bent portion reads on either the horizontally extending zigzag line 3" located above the dark horizontally extending zigzag line in marked up Figure 3b or the horizontally extending zigzag line 3" located below the dark horizontally extending zigzag line in marked up Figure 3b. Claim 3 fails to require four bent portions as shown in applicant's Figure 6. Claim 3 fails to exclude additional bent portions which do not have a zigzag amplitude. **Second:** Examiner acknowledges that the dark "vertically extending" (radially extending / normal line direction) zigzag trace in marked up Figure 3b has a constant tilt angle. However, Lagnier 965 teaches varying the tilt angle and wavelength in the radial direction of a radially extending zigzag trace of a sipe (the dark vertically extending line in marked up Figure 3C of Lagnier 965) such that the angle theta ("tilt angle") decreases toward the sipe bottom and the wavelength lambda increase toward the sipe bottom. Lagnier 965 suggests changing angle theta

(tilt angle) and wavelength lambda of Beckmann et al's radially extending zigzag trace such that the angle theta ("tilt angle") decreases toward the sipe bottom and the wavelength lambda increase toward the sipe bottom to obtain the predicted and expected benefit of regulating rigidity and obtain greater uniformity of wear. Lagnier 965's Figure 3C teaching is applicable to Beckmann et al's sipe formed by the Figure 3b metal sheet since Lagnier 002 teaches that the wavelength of a radially extending zigzag trace (the dark vertically extending zigzag trace in marked up Figure 3 of Lagnier 002) may vary in the depth direction of a sipe, which like Beckmann et al's sipe, is a 3-D sipe having zigzag traces extending in different directions. **Third**: It is noted that the amplitude in the circumferential direction of the radially extending zigzag trace (the dark vertically extending zigzag trace) in each of Beckmann et al's Figure 3b sipe, Lagnier 965's Figure 3C sipe and Lagnier's Figure 3 sipe is constant. When the varying angle theta ("tilt angle") and wavelength lambda teaching of Lagnier 965 is applied to Beckmann et al 's sipe made by the Figure 3b metal sheet while keeping amplitude in the circumferential direction constant, the amplitude in the radial direction of the zigzag bending lines 3" must increase toward the sipe bottom. **Fourth**: Applicant argues: "In order to incorporate these features of Lagnier 965 into the cut-outs [sipes] of Beckmann, it is necessary that the amplitude of each of the bending lines 3" of Beckmann remain constant, while the linear distance between bending lines 3" increases as a function of depth" (page 6 of response filed 1-28-09). This argument is not persuasive since it only considers two dimensions ("X" direction and "Y" direction) and fails to consider varying angle theta and the constraint of the constant amplitude in the circumferential direction

("Z" direction). **Fifth**: Applicant argues that Lagnier 002 is silent regarding a line extending in the tire axial direction and having a zigzag shape with an amplitude in the tire radial direction. More properly, Beckmann et al is not silent in that Beckmann et al discloses a line extending in the tire axial direction and having a zigzag shape with an amplitude in the tire radial direction. See the dark horizontally extending line in the above marked up Figure 3b of Beckmann et al. **Sixth**: Applicant argues that amplitudes A, B, C and D increase as a function of the depth of the sipe. This argument is not commensurate in scope with the claims and is therefore not persuasive since claim 3 fails to require four bent portions having four different amplitudes A, B, C and D. **Seventh**: With respect to applicant's comment that the construction shown in Figure Z on page 8 of the response filed 1-28-09 advantageously enhances tire performance during both braking and cornering, while still allowing the tire to be easily released from a mold, examiner notes (a) the claimed invention has not been compared with Beckmann et al's tire having sipes made by the Figure 3b metal sheet and (b) the results in Table 2 of applicant's disclosure are for sipes having four bent portions having amplitudes A, B, C and D whereas claim 3 only requires two bent portions.

6) No claim is allowed.

7) **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
May 10, 2009